

ABSTRACT

A differential encoder is designed to correct for any phase invariance. Without differential encoding defined for the V.92 upstream, undetectable errors are possible in a modem due to an inversion in the upstream channel. Immunity to channel inversions is provided by differentially encoding a combined precoding and modulus conversion system. A frame of a constellations is attributed a sign and the frame and the sign are differentially encoded. The frame and the sign are differentially decoded after the multiple modulus decoder, ensuring phase shift immunity.